



Figure 1. Breeder seed field at maturity at Rio Farms near Monte Alto, Texas, which is one of the 12 accessions that make up La Salle Germplasm Arizona cottontop. Photo by Forrest S Smith

## NOTICE OF RELEASE OF LA SALLE GERMPLASM

# ARIZONA COTTONTOP

## SELECTED CLASS OF NATURAL GERMPLASM

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### ABSTRACT

A selected germplasm of Arizona cottontop (*Digitaria californica* (Benth.) Henr. [Poaceae]) has been released for rangeland reseeding and wildlife habitat enhancement plantings in the Rio Grande Plain of Texas. La Salle Germplasm Arizona cottontop is a blend of 12 selected accessions from an extensive evaluation at multiple sites in southern Texas. The release comprises accessions that are increased from the original seed collections of native populations to maintain the genetic integrity of each accession. This germplasm represents the first commercially available release of Arizona cottontop that originates from the intended area of use.

Smith FS, Ocumpaugh WR, Maywald PD, Lloyd-Reilley J, Maher SD, Pawelek KA, Scott AW Jr, Garza J. 2009. Notice of release of La Salle Germplasm Arizona cottontop: selected class of natural germplasm. *Native Plants Journal* 10(1):43–47.

### KEY WORDS

*Digitaria californica*, Rio Grande Plain

### NOMENCLATURE

USDA NRCS (2008)

### COLLABORATORS

South Texas Natives CKWRI-TAMUK, Kingsville, Texas; USDA NRCS E “Kika” de la Garza Plant Materials Center, Kingsville, Texas; Texas Agrilife Research-Beeville, Beeville, Texas; and Rio Farms Inc, Monte Alto, Texas.





**Species** | *Digitaria californica* (Benth.) Henr.

**Common Name** | Arizona cottontop

**Accession number** | 9093398

La Salle Germplasm Arizona cottontop (*Digitaria californica* (Benth.) Henr. [Poaceae]), a Texas Selected Native Plant Germplasm eligible for seed certification under the Texas Department of Agriculture (TDA) and Texas Administrative Code guidelines (TAC 2007), is available for use in the Rio Grande Plain of Texas. As a selected class release, this selection will be referred to as La Salle Germplasm Arizona cottontop, USDA Natural Resources Conservation Services (NRCS) accession number 9093398, and Agricultural Resources Service (ARS)–Germplasm Resources Information Network (GRIN)–National Plant Germplasm System (NPGS) PI number 652936.

## JUSTIFICATION

This germplasm is the first release of an Arizona cottontop germplasm that originates from the Rio Grande Plain of southern Texas. Other releases of Arizona cottontop are PMT-389 (Culberson County, Texas, informal) and 'Loetta' (Arizona, cultivar) (USDA NRCS 2007). Neither of these releases meets current standards for use of native seeds in the Rio Grande Plain as outlined by the USDA NRCS Range Planting Code 550 (USDA NRCS 2007). La Salle Germplasm does meet these standards, and is further justified for release because no other commercial sources of Arizona cottontop are currently available in the intended area of use. The name La Salle Germplasm was chosen because 3 of the 13 accessions constituting the germplasm originated from native populations in La Salle County, Texas.

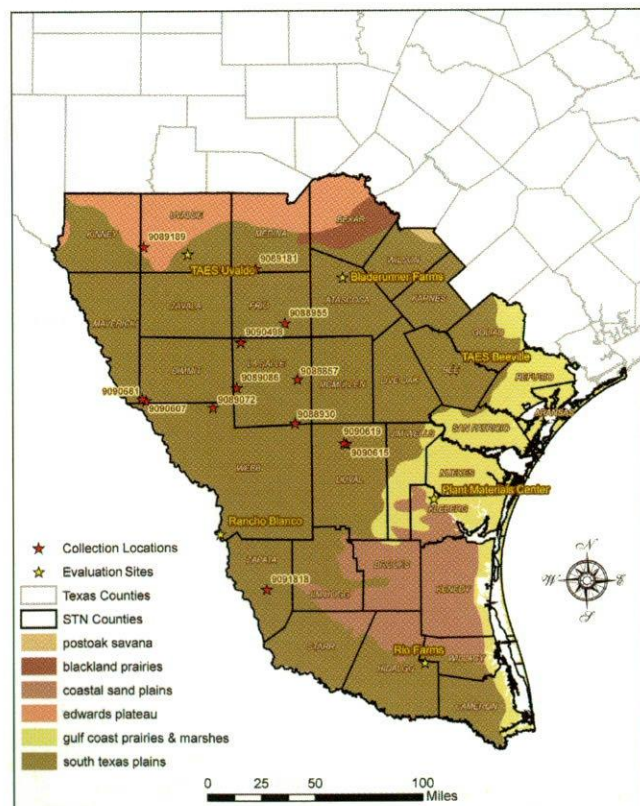
## COLLECTION SITE INFORMATION

Accessions contributing to La Salle Germplasm Arizona cottontop were collected from native plants at 12 locations throughout the Rio Grande Plain ecoregion. Original collections were hand harvested from stands observed in seed collection efforts across the region. Seeds were hand stripped from as many plants as possible at each collection site. Collections were cleaned, assigned individual accession numbers, and stored for evaluation. Accessions selected for release as La Salle Germplasm originate from 9 counties and from a variety of range sites and soil types.

## DESCRIPTION

La Salle Germplasm Arizona cottontop is a warm-season perennial bunchgrass that grows 61 to 122 cm (2 to 4 ft) in height. Plants of Arizona cottontop are long-lived and will produce seeds during all months of the year under favorable

conditions. Accessions that make up La Salle show some genetic variation in plant size, leaf blade width, seedhead length, pubescence, and coloration. The release comprises accessions that are increased from the original collection of a native population, and in spatially discrete increase fields to maintain the genetic integrity of each accession. Seeds harvested from each increased accession are blended by equal percentages of pure live seed (PLS) following harvest. Accessions included in the release have shown superior performance in several ecological and agronomic performance categories as well as in the higher mean percentage of active



Collection sites for germplasm used in developing Arizona Cottontop.



seed germination of accessions sampled from the target ecoregion of the release.

## METHOD OF SELECTION

Criteria for selection of accessions for initial evaluation included viability of original seeds, geographic origin, and soil type of collection location. Geographic origin, soil type, and amount of original seeds were evaluated by analysis of the collection information provided for each of 52 accessions of Arizona cottontop collected by the South Texas Natives program from 2001 to 2003. (South Texas Natives is a native plant development project whose primary goal is the development of native plant materials for revegetation and restoration practices in south Texas.) Information included specific locale of the collection (ranch, county road, and so forth), county of the collection site, and major soil type where plants were found. A minimum of one accession from each county and soil type where Arizona cottontop was collected was included in the initial evaluation.

Viability of original seeds was determined by sowing 10 bulk seeds per cell in 72-cell seedling flats filled with commercially available potting medium. Trays were placed in greenhouses with growing conditions of 12 h with daytime temperature maintained near 30 °C (86 °F) and 12 h with night temperature near 18 °C (64 °F) and were watered daily to maintain adequate soil moisture for optimum germination. This greenhouse evaluation of original seeds resulted in the selection of 34 accessions for field evaluation. Those selected had a minimum of one live plant per cell after 60 d in greenhouse conditions.

Initial field evaluation plots of these 34 accessions were established at 4 locations in the Rio Grande Plain of south Texas. Commercially available releases PMT-389 and Loetta were also planted for evaluation at each location for comparison. Evaluation locations were Rancho Blanco near Laredo, Rio Farms near Monte Alto, the E "Kika" de la Garza Plant Materials Center near Kingsville, and Texas AgriLife Research Station-Uvalde near Uvalde. The sites represent broad geographic distribution (125 to 355 km [77 to 220 mi] between sites), differing climatic conditions, and 4 common soil types in which native populations of Arizona cottontop commonly occur (silt loam, sandy loam, clay, and clay loam). At each location 2 replications of 10 transplants of each accession were established in randomized, spaced plantings (30 cm [12 in] between plants), complete block design, on 90-cm (36-in) rows. Plants were irrigated to ensure establishment during the initial growing season. Plantings were not irrigated after September 2004. In 2004, visual rankings (1 to 9; 1 = best, 9 = worst) were given monthly (from May through November) to each replication of each accession for plant vigor, foliage den-



Figure 2. Certified seed field of La Salle Germplasm Arizona cottontop at Bladerunner Farms near Poteet, Texas; field was planted from 12-accession breeder seed blend. Photo by Forrest S Smith



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sity, uniformity, development stage, seed production, biomass production, and plant height. In 2005, visual rankings were recorded bi-monthly (from March through November) for each replication. Seeds were collected when ripe from each accession throughout the growing season in 2004 and 2005, and were tested for active seed germination in germination chambers (3 replications x 50 seeds per accession, 12 hr light at 30 °C [86 °F], and 12 hr dark at 18 °C [64 °F]). Active seed germination was recorded for each accession at 3-d intervals for 30 d.

Accessions were selected for release and seed increase by analysis of visual rankings and germination tests in 2004 through 2005. Accessions were ranked by performance in field evaluation (categories given equal consideration and combined by location) and percentage of active germination (2-y mean), for a total of 8 evaluation categories (evaluations at 4 sites, germination at 4 sites). Accessions selected were those with greater than mean performance in the greatest number of evaluation categories. The releases PMT-389 and Loetta had acceptable performance in terms of survival and seed production; however, distinct differences in initiation of growth, seed set, and plant dormancy were noted. A severe degree of lodging was noted in plantings of Loetta at 3 evaluation locations. Mean plant vigor ratings of PMT-389 were lower than most south Texas-collected accessions at 2 of the evaluation locations, and limited seeding trial data from studies performed at the E "Kika" de la Garza Plant Materials Center showed greater emergence and higher seedling density of a composite of south Texas-collected accessions in comparison with PMT-389, 6 mo after planting.

Following selection, accessions were increased using the original seeds. Transplants (5000) of each accession were grown and outplanted in 0.05 ha (0.12 ac) isolated breeder blocks. Seeds from these breeder blocks of each accession were harvested and bulked by an equal percentage of PLS of each accession, so that the genetic integrity of each accession is maintained, and the potential for genetic shift or adaptation to the breeder field site is minimized. The bulked breeder blend is released to commercial growers as foundation seeds through the Texas Foundation Seed Service for establishment of certified seed fields of La Salle Germplasm Arizona cottontop.

## ECOLOGICAL CONSIDERATIONS

Arizona cottontop is a naturally occurring species in Texas and planting it would therefore not constitute an introduction of an exotic species into local ecosystems. Any negative impacts on other native plant species would likely be minimal to non-existent. Also, release of this species will make available an additional native species for rangeland planting.

## ANTICIPATED CONSERVATION USE

La Salle Germplasm Arizona cottontop will provide a native grass species for rangeland revegetation and wildlife habitat plantings in the Rio Grande Plain of south Texas.

## ANTICIPATED AREA OF ADAPTATION

La Salle Germplasm is known to be adapted to the region south of lat 29°27'N and west of long 97°47'W. The southern and western boundary of known adaptation is the Rio Grande River; the area of adaptation encompasses the Rio Grande Plain Ecoregion, or Major Land Resource Area 83.

## AVAILABILITY OF PLANT MATERIALS

Foundation Seed is produced by South Texas Natives and distributed through the Texas Foundation Seed Service. Certified seeds may be grown within the State of Texas. Limited quantities of seeds for research or evaluation purposes will be available on request from Forrest Smith (forrest.smith@tamuk.edu).

## REFERENCES

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